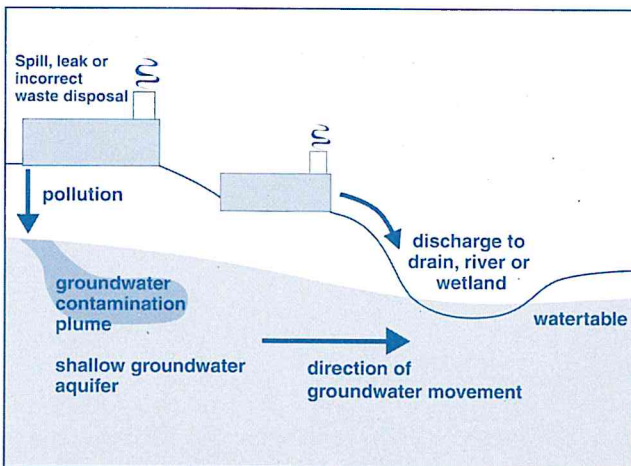


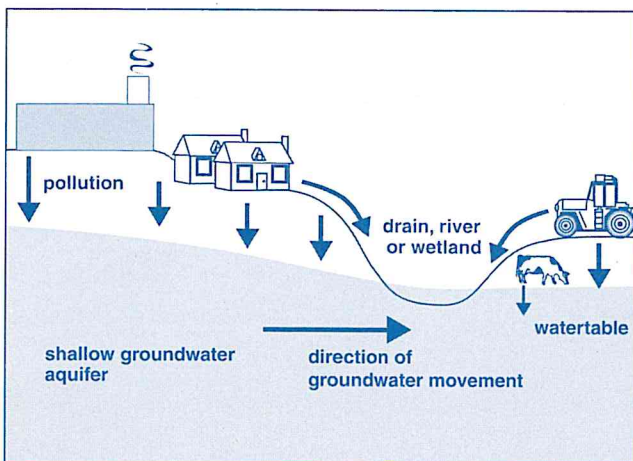
Waterways pollution

Water quality problems occur in the Swan-Canning estuarine system and its tributaries (streams and drains). A waterways pollutant is any substance that is added to water in large enough quantities to cause problems for birds, aquatic plants, animals and people. Increased population and urban development, and greater use of the river for recreation, sporting, fishing and other activities, has resulted in increased discharge of water to the Swan River system and increased the risk of contamination.

Pollutants come from a number of different sources in urban and rural areas. Some come from a particular activity occurring at a particular location (point source pollution). However, most pollution comes from a wider or more diffuse area (non-point pollution). Pollutants can be carried into streams from normal drainage (runoff) from the land or from industrial and stormwater drains. They can be leached through the soil to the groundwater, which moves underground and then into the river.



Point source pollution



Diffuse sources of pollution

(Water facts 10, Groundwater pollution)

Domestic suburban pollutants include detergents, oils, chemicals (e.g. chemicals in solvents, cleaners, paints), fertilisers, pesticides, herbicides, bacteria and nutrients from septic tanks, litter (e.g. plastics, cigarette butts, metal, polystyrene, cardboard), domestic animal wastes, grass clippings and other garden rubbish (e.g. plant cuttings and seeds) and building materials (e.g. sand and cement).

Industrial pollutants include wastewater from factories and workshops (e.g. from washing down machinery). It also includes hot water.

Agricultural pollutants include commercial fertilisers (phosphates and nitrates) and pesticides (insecticides, herbicides and fungicides) that are used in rural areas. Animal wastes (e.g. droppings) come from paddocks, dairies, horse stables and animal yards. High levels of nutrients in the form of nitrogen and phosphorus from fertilisers and wastewater may cause accumulation of nutrients and excessive growth of algae in wetlands and waterways. This is known as eutrophication. The death and decay of algae can produce stagnant (low oxygen) conditions which can cause fish kills. Some algal blooms are toxic. Problem algal blooms occur mainly in late spring and summer when water levels are low, the water is warm and nutrient concentrations are high.

Salt can be a pollutant. Rising stream salinity results from people clearing vegetation in agricultural areas. In particular it is caused by the clearing of deep-rooted native vegetation (which uses much of the water in the watertable, keeping the salt down), and replacing it with shallow-rooted crops and pastures that use less water. The watertable rises, bringing salts to the surface. Salty water can find its way into waterways and cause massive ecological and economic problems.



Water from across the catchment eventually finds its way into the estuary. This means that pollutants from all land uses in the catchment can also end up in the estuary.

Excess turbidity (muddiness) can also be a pollutant. It may be caused by a variety of activities that lead to erosion of the catchment and of river banks (e.g. clearing the vegetation of the river bank and allowing unrestricted access of cattle and sheep). Excess turbidity reduces the amount of light that can penetrate the water, which may limit the growth of algae and other aquatic plants including seagrasses. In extreme cases fine particles may also coat and choke the gills of fish. Sediments can be carried down the river and accumulate in river pools or in the estuary, and can eventually fill and destroy pools.

Pollutants can have **direct and indirect effects** on river health. Petroleum products and toxic chemicals directly affect aquatic life. Domestic and animal wastes can contribute to the build-up of excess nutrients, algal blooms and blooms of toxic blue-greens, causing the death of wildlife and threatening human health. Bacteria and viruses can be a public health concern.

Aquatic weeds can grow and deprive the waterways of oxygen, particularly when they die. Sunlight can't get through and the water stagnates and smells. Weeds can affect birds and other wildlife.

Some pesticides do not break down rapidly in the environment. Once ingested, aquatic organisms cannot eliminate them from their systems, so these substances are incorporated into all feeding levels in the food web.

Further reading:
River and Estuary Pollution, Water facts No 3, Water and Rivers Commission, 1997.
Groundwater Pollution, Water Facts No 10, Water and Rivers Commission, 1998.



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